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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/909,417

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Masahiro Yatake

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EXAMINER

SHOSHO, CALLIE E

ART UNIT

PAPER NUMBER

1714

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/23/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

09/909,417

**Applicant(s)**

YATAKE, MASAHIRO

**Examiner**

Callie E. Shosho

**Art Unit**

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11/24/06 & 12/13/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-8, 11, 12, 15-17 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-8, 11, 12, 15-17 and 19-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/22/07</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

**Continued Examination Under 37 CFR 1.114**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/24/06 has been entered.

**Information Disclosure Statement**

2. It is noted that JP 62-15274 and JP 59-59755 have been stricken from the IDS filed 1/22/07 as redundant given that these references were already cited on the PTO-892 mailed with the office action of 1/24/03.

**Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Prior to setting forth the rejections, it is noted that claims 16-17 are rejected in both paragraph 6 and paragraph 8 below. Given that claims 16-17 require 0-10% substance of formula (2), claims 16-17 are rejected when the claims encompass no substance of formula (2), i.e. 0%, (see paragraph 6) and when the claims encompass the presence of substance of formula (2), i.e., amount greater than 0% (see paragraph 8).
5. Claims 4-5, 7-8, 11-12, 15-17, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. (U.S. 5,945,155) in view of WO 00/22056.

Yui et al. disclose ink comprising water, colorant including self-dispersing pigment produced by surface chemical reaction including plasma treatment, i.e. surface oxidation, 3-50% solvent such as glycerin, and 0.01-20% ethylene oxide/propylene oxide adduct of polyglycerin, i.e. saccharide-alkyleneoxy derivative, that comprises 0-200 repeating units of the formula  $\text{CH}_2\text{CHRO}$ , degree of polymerization of 2-30, and molecular weight of 166-250. There is also disclosed method for ink jet printing wherein the above ink is ejected from ink jet printer onto substrate (col.2, lines 30-54, col.3, lines 1-53, col.5, lines 15-28, and col.7, lines 6 and 40-42).

Attention is drawn to example 2 which discloses ink comprising 55% pigment dispersion, 12% glycerin, 7% EO/PO adduct of polyglycerin, and water.

The difference between Yui et al. and the present claimed invention is the requirement in the claims of (a) glycol ether and 1,2-alkylene glycol and (b) surface tension of the ink.

With respect to difference (a), WO 00/22056<sup>1</sup>, which is drawn to ink jet inks, discloses the use of 3-30%, preferably, 5-10%, glycol ether such as diethylene glycol monobutyl ether, triethylene glycol monobutyl ether, dipropylene glycol monobutyl ether, and propylene glycol monobutyl ether in order to improve the drying properties of the ink, improve the ability of the ink to penetrate the recording medium, and to suppress feathering or bleeding. It is noted that WO 00/22056 also discloses that the glycol ether is used in combination with 0.1-3% acetylene glycol surfactant in order to improve print quality and to prevent foaming or precipitation of the ink in the printer nozzles. Additionally, WO 00/22056 discloses the use of 0.5-20%, preferably 3-10%, 1,2-alkanediol, i.e. 1,2-alkylene glycol, such as 1,2-hexanediol or 1,2-pentanediol in order to prevent feathering or bleeding in prints and to improve print quality (col.3, lines 49-67 and col.5, line 17-col.6, line 17).

In light of the motivation for using glycol ether and 1,2-alkanediol disclosed by WO 00/22056 as described above, it therefore would have been obvious to one of ordinary skill in the art to use glycol ether and 1,2-alkanediol in the ink of Yui et al. in order to form ink with

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<sup>1</sup> It is noted that when utilizing WO 00/22056 in the above paragraph, the disclosures of the reference are based on Hayashi (U.S. 6,500,248) which is an English language equivalent of the reference. Therefore, the column and line numbers cited with respect to WO 00/22056 are found in Hayashi.

improved drying properties, improved ability to penetrate recording medium, and improved print quality that does not feather or bleed, and thereby arrive at the claimed invention.

With respect to difference (b), Yui et al. disclose using surfactant to control surface tension, but is silent with respect to actual values of surface tension.

WO 00/22056, which is drawn to ink jet inks, discloses controlling the surface tension of ink jet ink to values below 40 mN/m in order to improve penetration of the ink into paper and ensure wettability of materials constituting the recording head by the ink in a well balanced manner so that the print quality and reliability are improved (col.8, lines 52-62).

In light of the motivation for controlling the surface tension of ink jet ink to values below 40 mN/m disclosed by WO 00/22056 as described above, it therefore would have been obvious to one of ordinary skill in the art to control the surface tension of the ink of Yui et al. to such values in order to produce ink that has good penetration into paper as well as good print quality and reliability, and thereby arrive at the claimed invention.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. in view of WO 00/22056 as applied to claims 4-5, 7-8, 11-12, 15-17, and 19-23 above, and further in view of *Introduction to Physical Polymer Science*.

The difference between Yui et al. in view of WO 00/22056 and the present claimed invention is the requirement in the claim of the molecular weight distribution of the saccharide-alkyleneoxy derivative.

Yui et al. disclose the molecular weight of the ethylene oxide/propylene oxide adduct of polyglycerin or saccharide-alkyleneoxy derivative, however, there is no disclosure that this saccharide derivative has molecular weight distribution of 2 or more.

However, given that Yui et al. disclose saccharide-alkyleneoxy derivative identical to that presently claimed, it would have been obvious to one of ordinary skill in the art that the saccharide-alkyleneoxy derivative would intrinsically possess same molecular weight distribution as presently claimed.

Evidence to support this position is found in *Introduction to Physical Polymer Science* (pages 97-99), which discloses that the polydispersity or molecular weight distribution of a polymer depends on the type of polymerization used to make the polymer. As seen on page 99, chain polymerization results in polymer with polydispersity of 1.5-3 while step polymerization results in polymer with polydispersity of 2-4.

Thus, given that Yui et al. disclose saccharide-alkyleneoxy derivative identical to that presently claimed which is necessarily made by the same polymerization process as the saccharide-alkyleneoxy derivative presently claimed, it is clear that the saccharide-alkyleneoxy derivative of Yui et al. would intrinsically possess the same molecular weight distribution as presently claimed, and thus, one of ordinary skill in the art would have arrived at the claimed invention.

7. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. in view of WO 00/22056 and EP 978547.

Yui et al. disclose ink comprising water, colorant including self-dispersing pigment produced by surface chemical reaction including plasma treatment, i.e. surface oxidation, 3-50% solvent such as glycerin, and 0.01-20% ethylene oxide/propylene oxide adduct of polyglycerin, i.e. saccharide-alkyleneoxy derivative, that comprises 0-200 repeating units of the formula  $\text{CH}_2\text{CHRO}$ , degree of polymerization of 2-30, and molecular weight of 166-250 (col.2, lines 30-54, col.3, lines 1-53, col.5, lines 15-28, and col.7, lines 6 and 40-42). Attention is drawn to example 2 which discloses ink comprising 55% pigment dispersion, 12% glycerin, 7% EO/PO adduct of polyglycerin, and water.

The difference between Yui et al. and the present claimed invention is the requirement in the claims of (a) glycol ether and 1,2-alkylene glycol and (b) compound of the formula  $\text{R}-(\text{EP})_m-\text{OH}$ .

With respect to difference (a), WO 00/22056, which is drawn to ink jet inks, discloses the use of 3-30%, preferably, 5-10%, glycol ether such as diethylene glycol monobutyl ether, triethylene glycol monobutyl ether, dipropylene glycol monobutyl ether, and propylene glycol monobutyl ether in order to improve the drying properties of the ink, improve the ability of the ink to penetrate the recording medium, and to suppress feathering or bleeding. It is noted that WO 00/22056 also discloses that the glycol ether is used in combination with 0.1-3% acetylene glycol surfactant in order to improve print quality and to prevent foaming or precipitation of the ink in the printer nozzles. Additionally, WO 00/22056 discloses the use of 0.5-20%, preferably 3-10%, 1,2-alkanediol, i.e. 1,2-alkylene glycol, such as 1,2-hexanediol or 1,2-pentanediol in order to prevent feathering or bleeding in prints and to improve print quality (col.3, lines 49-67 and col.5, line 17-col.6, line 17).



With respect to difference (b), EP 978547, which is drawn to ink jet inks, discloses the use of compound of the formula  $R-[(EO)_n(PO)_m]_k-T$  where R is  $C_4-C_{10}$  alkyl, T is OH, k is 1, and n and m are integers. The motivation for using such compound is to produce ink that realizes good images having good drying speed and no significant feathering (paragraphs 1 and 9-11).

In light of the motivation for using glycol ether and 1,2-alkanediol disclosed by WO 00/22056 as described above and for using  $R-[(EO)_n(PO)_m]_k-T$  disclosed by EP 978547 as described above, it therefore would have been obvious to one of ordinary skill in the art to use glycol ether and 1,2-alkanediol in the ink of Yui et al. in order to form ink with improved drying properties, improved ability to penetrate recording medium, and improved print quality that does not feather or bleed and to use  $R-[(EO)_n(PO)_m]_k-T$  in the ink of Yui et al. in order to produce ink that that realizes good images having good drying speed and no significant feathering, and thereby arrive at the claimed invention.

#### **Response to Arguments**

8. Applicant's arguments filed 11/24/06 have been fully considered but they are not persuasive.

Specifically, applicant argues that the rejections of record utilizing Yui et al. are no longer applicable against the present claims in light of the comparative data set forth in the declaration filed 12/13/06.

The declaration compares ink of the present invention, i.e. comprising triethylene glycol monobutyl ether and 1,2-hexanediol, with example 2 of Yui et al., i.e. comprising no triethylene glycol monobutyl ether or 1,2-hexanediol. Using each of the inks, a printed page for each ink

was created. Applicants argue that the printed sheet obtained from the ink of Yui et al. shows less color development and white streaks generated in solid printing portions and large characters and that a close-up of one letter on the printed page shows that the image obtained from the ink of Yui et al. is thinned and blurred.

However, it is the examiner's position that the declaration is not persuasive in establishing unexpected or surprising results over the cited prior art given that there appears to be little, if any, difference between printed sheet created by inventive ink and the printed sheet created by the ink of Yui et al.

From the printed sheet, it is not clear where the inventive ink and the comparative ink differ. The large letters and solid printing portion of each printed sheet appear identical or so close that the differences do not appear to be significant. Further, for instance, more white streaks appear to be found in the bar graph (especially Braves) of the inventive ink than the comparative ink.

Similarly, with respect to the close-up, there appears to be no significant difference between the inventive ink and the comparative ink. While applicants state that the comparative ink of Yui et al. produces a more blurry image, such difference is not readily apparent. Further, while there may be a slight difference in terms of size in that some portions of the letter produced by the comparative ink appear thinner, it is not clear if this difference is significant or what the significance of such result is. Attention is drawn to MPEP 716.02(b) that discloses that evidence relied upon should establish "that differences in results are in fact unexpected and unobvious and of both statistical and practical significance", *Ex parte Gilles*, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Inter. 1992).

Thus, given that the evidence provided by applicant does not provide clear and convincing evidence to establish unexpected or surprising results over the cited prior art, it is the examiner's position that the rejections of record remain relevant against the present claims.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

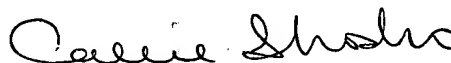
JP 62-15269, an English translation of which is included in this office action, discloses ink comprising pigment and alkylene oxide additive of sorbitol, however, there is no disclosure of C<sub>3</sub>-C<sub>12</sub> saccharide, water-soluble pigment, glycol ether, or 1,2-pentanediol/1,2-hexanediol as presently claimed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS  
3/18/07